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CONSUMERS' GUIDE

MORE MILK

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Consider the cow

She, too, is being enlisted for National Defense, and here are ways that farmers can help her produce more milk

COWS, Inc., has an order for 1942 that's the largest ever.

The Nation has asked the 25 to 26 million cows that graze in America's pastures to deliver 125 billion pounds of milk in 1942. That is 7 percent, or 8 billion pounds, more than is scheduled to be produced in 1941.

A vice-president in charge of production in a bombsight factory, when asked to jump production, might press a button for the personnel man and tell him, when he comes running, to employ more labor.

In the firm of Cows, Inc., someone might blow a horn to give the signal to unemployed cows to come to work. But there are complications. In a way there are unemployed cows; at least there are a great many cows that aren't milked. Each year also a great many cows that might keep on working are retired from milk production by the butcher.

For example, this year, 1941, there are—besides the 25 to 26 million cows kept for milk—some 11 million other cows of a type that could have been milked, had it paid to do so. Then, in 1942 some 5½ million heifers will come of age, that is, develop into full-fledged milk producers.

Cows, of course, are mortal, and some will die and some will sicken. Roughly, however, there is a potential milk cow reserve in the country amounting to more than 15 millions.

THESE ENORMOUS MILK COW RESERVES, however, are strictly theoretical. The 11 or so million cows that might be milked include beef cows that are not usually milked for very good reasons. Either they are inefficient producers of milk or they are more valuable as beef cows than as milk cows. To say the same thing another way, there is no market at present where all the milk they might produce could be sold as profitably as the beef they produce. However, in some sections of the country, especially the Middle West, such cattle are milked when butterfat prices are attractive. The cream is sold and the skim milk is kept on the farm. Under pressure of the Food-for-Freedom program, some of these cows are going to become milk cows in 1942 but not many.

Then again, in years when the headlines aren't so black, about 20 percent of all the milk cows are ticketed for the butcher. Their places in dairy herds are then taken by some up-and-coming heifers. Now again, if Cows, Inc., were organized to produce all the milk that might be produced, no matter how much the milk cost, most of the retired cows could be kept working, and all the heifers capable of producing milk would produce milk.

But the farmers who are the managers of Cows, Inc., can't keep cows for milk unless the milk can be sold at fair prices.

What happens is that farmers cull the

YOU COULD INCREASE the number of milk-producing cows by many percent if you didn't care how much it cost or how long it took. You could feed the milk cows we have to give 20 percent more milk, again if you didn't care how much it cost. But you do care. More-milk programs have to take many different costs into account.

least efficient cows out of their herds and keep the most efficient cows. While there is theoretically a reserve of some 15 million cows, actually only about 750 thousand more cows will be milked in 1942.

Three percent is the increase in the number of cows expected in 1942 over 1941. The total increase in milk production, however, necessary to attain the Food-for-Freedom milk goal is 7 percent.

IF COWS, INC., HAD A BOARD OF DIRECTORS, and if the directors were ruminating at this moment over methods by which milk production for 1942 could be increased 7 percent over the production for 1941, something like this might occur.

"Mesdames," the chairwoman might say, "we must call on each cow to produce more milk. If each cow," she could exort them, "would only produce on the average one pound more milk a day—slightly less than a pint—that would add up to 25 million extra pounds a day. Multiply that by 365 and it comes to more than 9 billion pounds a year. That is a billion pounds over the 1942 goal for extra milk."

If the 25 to 26 million cows we have in 1942 are going to produce an average of some 4,864 pounds per cow—altogether that's 125 billion pounds of milk—why are our cows in 1941 producing an average of 165 pounds less than this 1942 goal, and why did our cows in 1940 turn out an average of 296 pounds under the 1942 figure?

A COW HAS NO INCLINATION WHATEVER TO lie down on the job. But in the long run she cannot produce more milk than she has the raw material for. Not all the milk the cow makes is available for sale. Calves naturally suckle some of it.

Farmers, as is well known, raise or buy the grain and roughage they feed their cows. Actually, however, a farmer can afford to feed cows hay and valuable grains only so long as the milk produced is worth more than the feed and the other costs necessary to produce it.

The price of dairy products and the price of feed, then, can act as restraints on the production of milk. Let there be a high price for feed with respect to milk and the farmer can't afford to produce extra amounts of milk.

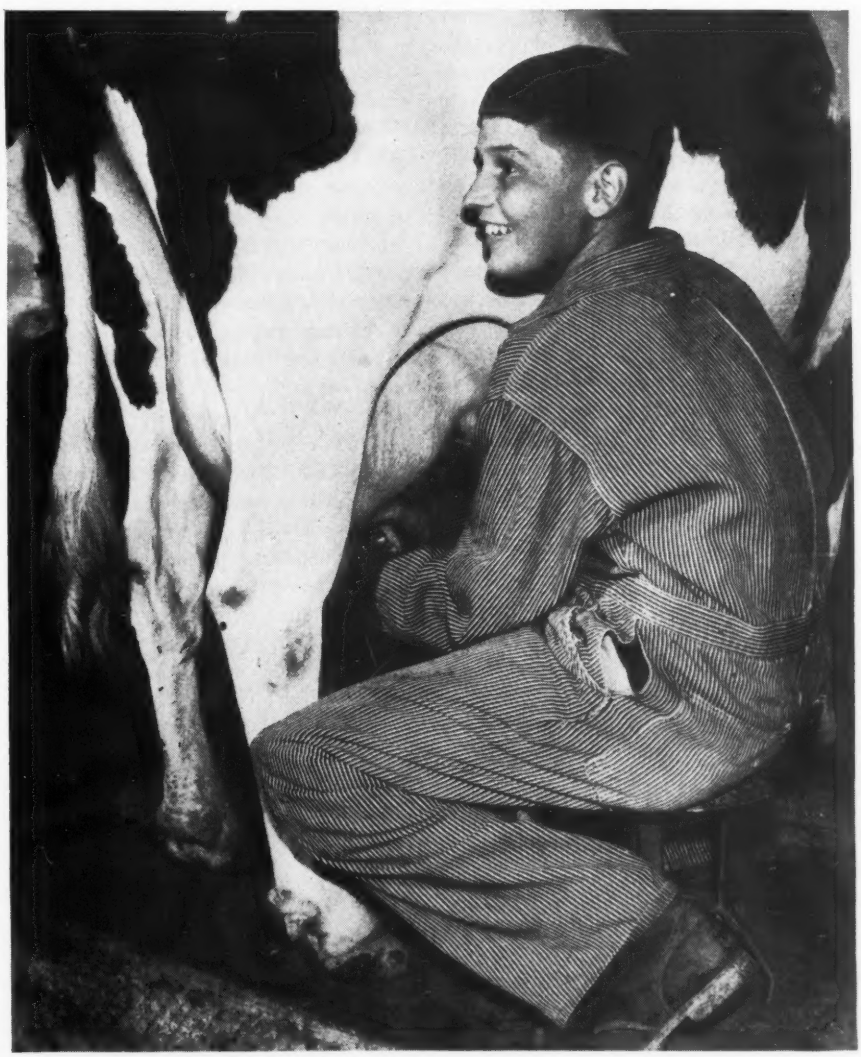
Putting aside price factors—something you can't do except in conversation—Cows, Inc., could produce considerably more milk—some say as much as 30 percent more milk than in 1941. This 30 percent increase could be won by feeding more grain (high protein content feeds) to cows and by milking some of them 3 times a day instead of twice a day, the customary number of times. An increase as big as this, however, would be achieved only if you didn't care how much it cost to produce the milk, and that, of course, is something that people do and must care about very much.

Input-output experts—they are the scientists who study the relationship between production on a farm and the use of land, labor, animals, feed, seed, and fertilizer—estimate that by just stepping up the grain ration of cows theoretically we could get 20 percent more milk production than now.

Milking some cows 3 times a day instead of twice a day, again theoretically, could increase milk production of some cows up to 20 percent.

USING THE 2 METHODS TOGETHER MIGHT not result in a 20 plus 20 percent increase in milk production. But there are experts who believe it should certainly result in an increase of at least 30 percent. That 30 percent, it should be remembered, is attainable only theoretically, and then only if your theory disregards the cost of milk production.

YOU COULD MILK some cows 3 times a day instead of the traditional practice of twice a day and get more milk than two-time milking gives if you had enough help or if you didn't care how much it cost to get the extra labor. But more milk programs must consider costs as well as gains.



Additional gains in milk production could be obtained by feeding cows hay that was cut earlier than is customary. The earlier hay would bulk less and yield less, but it would contain larger amounts of protein, more carotene, the substance from which Vitamin A is made, and would be more palatable to the cows. Palatability is important because a cow's appetite determines how much feed she will eat, and the amount of feed she eats determines her milk production. Feeding cows irregularly reduces their milk production. Regular feedings maintain production.

By eliminating weeds from the pastures, and by fertilizing pastures to improve the grass and increase yields, additional gains could be made in milk production. Not only do good pastures produce more feed, but in a good pasture a cow can get the feed she needs without using up energy hunting for it. In fact the very best feed a cow can get, as far as milk production is concerned, is the tender grass that grows up in spring and early summer.

If all farmers kept records of the milk production of each cow, when the time came to cull out the cows in their herds (and 20 percent of all cows have been culled out of herds in each recent year) they would have a better basis for selecting the better producers and less likely to send an efficient cow to the block.

Over long periods of time increased milk production will come from better cows obtained by mating the best available bulls with the best available cows.

A COW PUTS THE FEED SHE GETS TO 3 MAIN uses: maintenance, calf production, and milk production. To keep a 1,100-pound cow in condition to have a calf, and to keep the cow in good health without allowing her any feed for the production of milk, it takes each day 17 or 18 pounds of good hay, or 47 pounds of good corn silage, or 12 pounds of grain, or the equivalent amount of nutrients from pasture. That amount of feed a day gets an A–1 priority rating for maintenance. What you give a cow above this ration gets an A–2 priority rating for milk producing.

You cannot increase a cow's ration indefinitely and get an indefinite increase in milk production. Each cow has her own ceiling; that is, the maximum amount of milk she can produce. When you feed her more grain than she can turn into milk either she will start to put on fat or else she will refuse to eat the extra grain in front of her.

The poorest kind of scrub cows kept for

FOOD-FOR-FREEDOM plans include more milk products for shipment abroad. This is just one of thousands of cases of evaporated milk that will wend their way to far-off children and grown-ups who need more chance to eat for health these days.

milking purposes produce something like 2,000 pounds of milk a year, somewhat more than an average of a half gallon of milk a day. Actually, the cow will be dry part of the year, while in the spring she may produce more than a gallon of milk a day.

The most sensitive finely bred cows in the country have given as much as 30,000 pounds of milk a year, more than 10 gallons a day.

In between these 2 classes of cows is the average cow, which in 1940 is estimated to have produced something like 4,575 pounds of milk, about 1½ gallons a day. Precision here is impossible because actual records are kept on less than 5 percent of the cows milked in this country.

Input-output experts, from their observations, believe that while a very few cows are fed more than they can turn into milk, most American cows are not fed up to their capacity.

COW FEED IS OF 2 KINDS, ROUGHAGE AND concentrates. Concentrates are feeds with a high content of digestible nutrients. They are usually grains, and milk by-products, or bran, or cottonseed meal, or soybean meal. Roughage is a feed, such as hay or fodder, which is bulky and low in digestible nutrients.

As a rule dairy farmers give their cows all the roughage they will eat, but "measure" the concentrates out according to the price they pay for it, the price they get for their milk, and the milk production of the cow.

If you have a cow that is eating just enough to maintain her weight and you add a pound of grain to her diet a day, you can expect her to give about 1½ pounds more milk. Keep adding grain to her diet and the rate of increase in milk will fall off to a point where you will just get a pound of milk for each additional pound of grain you give her. Then if you give the cow still more grain, the ratio will continue to fall.

Long before you reach the limit of a cow's capacity to consume grain, however, you will likely come to the place where the additional grain costs more than the additional milk you get. Where this place is depends upon the prices of both milk and grain.

Increasing milk production by milking cows 3 times a day instead of 2 has its limiting factors, too. The cost of additional labor is one; whether or not the farmer thinks the additional milk is worth the trouble is another.

An extra milking a day sounds like a card trick. Just why the extra milking gives more milk is not known precisely, but the commonly accepted explanation is that the pressure of milk in the cow's udder causes the secretion of milk to be retarded. When the cow's udder is full, milk secretion comes almost to a stop. By more frequent milkings secretion over a longer period is encouraged.

ALL THIS SO FAR HAS BEEN ABOUT HOW TO get more milk from a given number of cows. Of course the purpose in getting more milk *from* cows is to get more milk and milk products *to* humans.

Now milk, as everyone knows, has in it butterfat, milk solids, and water. Humans can turn butterfat and milk solids to very good use. Milk provides minerals that bodies must have and provides them in a very easily usable form. That brings us around to this point.

There is a way to get more milk nutrients to consumers without increasing cow numbers or milk production. That can be accomplished by making a different use of some of the nutrients in milk.

Fifty to 60 percent of milk produced in our country is used to manufacture butter, fluid cream, ice cream, and cheese. When you manufacture butter and cream you get skim milk as a by-product. When you manufacture cheese you get whey as a by-product.

The manufacturing processes for these

foods up until now has resulted in (1) a considerable loss of whey; (2) the use of a very large proportion of the whey and skim milk as animal feed; (3) the use of only about one-fourth of the skim milk for the manufacture of skim milk products like cottage cheese, dry skim milk, and casein.

Skim milk and whey not used for food for human beings contain more than half of the milk proteins, the milk sugar, and milk minerals that are produced each year. These proteins and the minerals are the very nutrients that are most often deficient when diets are poor.

The Department of Agriculture has not only set the Nation an overall 1942 milk production goal, it has also set a production goal for skim milk in 1942 which would provide at least twice as much as was marketed last year for people. Prime purpose is to meet lend-lease needs.

IMPLICIT IN ANY MILK PRODUCTION GOAL there is, even if it is not stated, a milk consumption goal. Here consumers can make their contribution on the skim milk front.

They can form committees to call on their local milk distributors.

Where skim milk is hard to get, consumers might say, "Why don't you sell fluid skim milk and fluid skim milk products at prices that reflect the difference between what you pay for skim milk and what you pay for whole milk? If you do, we are reasonably certain that consumers will buy these low-cost milk foods in a volume that will make it worth your while."

In cities where it is not possible to buy dry skim milk, a group of consumers, by placing a group order with a dairy, could probably open the way for increased skim milk distribution.

WINNING THROUGH TO ALL THE GOALS established under the Food-for-Freedom program is of crucial importance to the Nation. On the Nation's farms, the goals will be achieved only if each farmer accepts his share of responsibility. In the same way consumers in cities have a chance, particularly with respect to the milk goal, to make their efforts count.

And if the full utilization of all the milk nutrients that are produced each year could be achieved, it would show up in more places than in statistical reports. You will be able to see it when children smile and reveal regular sound teeth; you will see it, too, in the shape and strength of their bones.

Stop food waste

You can stop it, right in your own community. Here's a blueprint for a campaign

TICK them off for yourself—the times and places where food is wasted in your town. There are left over tomatoes in Mrs. Tibbet's back yard. She or her friends can't use them. There's Farmer Brown's field of beans that he can't get the help to bring in. He'd be glad to let volunteers gather them for a community project. All of Mr. Jordan's peach crop can't be sold, maybe. The peaches are there on the trees for the picking. Look around your community and recall other chances to save.

Every ounce of fresh wholesome food wasted is a black mark against somebody, and, of course, home's one place to start saving. But there are wastes outside people's homes, before food ever reaches a house, way back on farms and in back yards. One way to make sure your town doesn't get a black mark for its food wastefulness is to organize a community food preservation center.

THE BUREAU OF HOME ECONOMICS OF THE Department of Agriculture has prepared a new bulletin, Community Food Preservation Centers, that will prove a helpful blueprint you can follow in getting one started in your community. Send 10 cents to the Superintendent of Documents, Washington, D. C., if you want a copy. It's based partly on the experience of communities who already have gone ahead and established such centers to see that nothing's wasted.

Communities that have tried such centers have found even temporary preservation centers have great uses. Permanent ones have still more. Besides the food that has been saved, centers can be clearing houses of information about food preserving methods for the whole locality. People who can't afford the equipment it takes to preserve surplus foods at home, can use the center to can their home grown fruits and vegetables for winter use. Inexperienced volunteers have a chance to learn under trained supervision how to can at home, and get valuable practice in working together in the bargain. Some centers also serve as bases of operation for distributing small local surpluses of fresh vegetables and fruits to families who need them for a healthy diet.

IF THE JOB OF BANISHING FOOD WASTES IS to be taken seriously, it needs more than a jolly spirit. It needs organizing a food preservation center that has a responsible place in the community.

What does it take to make such an efficient center come to life? The formula's simple. But don't fool yourself that it doesn't take

POTS and pans, knives and spoons, to equip a center don't always have to be brand new; just as good ones might be found in second hand stores.

CHURCH kitchens can be used for more than church suppers. Equipment there should not be idle if it can be used for a canning center, too.

plenty of hard work. Time and energy and planning have to go into it to make it a success.

First you need a leader—someone who can promote an idea and push it through. Leaders can't do much without workers so you have to interest volunteers. A place to work has to be found and the equipment to work with and the food to preserve. When all these factors work together, you'll have a food preservation center.

There are snags hidden in that simple formula, though. Lots of problems have to be met before the idea of a center becomes an actual operating reality. Here are some of them and some suggestions on meeting them.

ANY PLANS SHOULD BEGIN, SAYS THE BUreau of Home Economics bulletin, with: (1) a survey of possible food wastes; (2) a survery of food needs in your area. How much garden truck is going to waste for lack of a plan to save it? How many cans of vegetables do you need for your school lunches next winter? How many families would can from their own gardens if canning equipment were on hand for them to use? Only after you've totaled (1) resources and (2) needs, should you go ahead with your plans.

Initiative for organizing a center may come from one interested person. It may come from some public-spirited civic group. Nutrition committees, local Defense groups, women's clubs, youth groups, consumer organizations, labor unions, civic groups might furnish the spark to get going. They might assist after somebody else gave the idea a push. WPA, the Extension Service agents, Farm Security home supervisors and other government agencies, too, can make valuable contributions to the early plans.

IF THIS PRELIMINARY EXPLORATION OF THE possibilities of a food preservation center gets an enthusiastic "yes," the next step should be the organization of an advisory board. It will have to determine policy and settle the problems of financing and operating the center.

The board should represent as many as possible of the groups and agencies in the community that are interested in nutrition. The more this is true, the more the center will be a real community effort. It should belong to everybody and everyone should feel he has a contribution to make. An ideal board might include such people as these: A businessman or woman with practical financial judgment, to help figure costs and financing; a nutrition person, such as a home economics teacher or home demonstration agent, who if possible has had some experience with large scale canning operations; an agricultural representative like the county agent or a teacher of agriculture, who knows the food resources of the area; a civic leader; someone with practical engineering or mechanical experience to keep an eye on the plant itself, a PTA representative, and perhaps someone from your welfare agencies, if part of your plan involves distribution of food to low-income families.

You may not be able to find all these people for your board but it's a guide which you can adapt to your local needs.

NOWADAYS, THE BIGGEST SNAG YOU'RE likely to encounter won't be the financing of the center, though that's always a problem, but getting equipment for it. Shortages of strategic metals and curtailment of the manufacture of non-Defense articles that require metals, mean that you can't just figure out how much you can afford to spend for equipment, then go out and order that much. New stoves, aluminum pressure cookers, rubber rings, zinc tops for glass jars, even cans, to mention just a few items, may be harder and harder to get as the winter passes. But you can't have a canning center without tools.

Equipment suggestions from the Bureau of Home Economics bulletin list the following essentials for a small center:

- 4 40-quart pressure canners
- 3 or 4 stoves, or 6 gas or oil burners
- 1 water bath (a wash boiler can be used for this)
- 2 sinks
- 6 tables for receiving and preparing food and filling cans
- 1 tin-can sealer
- Buckets, tubs, pans, kettles, colanders and funnels, spoons and ladles, can lifters or tongs, measuring cups, knives, thermometer, and other ordinary kitchen equipment.

IT MAY TAKE INGENUITY AND IMAGINATION to figure out ways to get all this equipment this year, but it's far from impossible in most communities. Some of it can be donated, some home-made. Then you might try to think of all the places in your community where there are large well-equipped kitchens that aren't used all the time. One of your churches may have a good-sized kitchen used only for serving church suppers; it might serve your purposes. The high school cafe-

IF your fire station has a kitchen, why not consider using it for your canning operations when the firemen don't use it for their meals.

teria might be used at night or in the summer. Canning season and school sessions don't often conflict, and stoves and sinks, tables and pots and pans, knives and spoons are there for the asking. Clubs, too, often have kitchens that are used only occasionally and would make ideal canning centers. One community we heard of even took over the kitchen of the local fire station for its canning plant last summer. For canning late vegetables, summer hotels that close down after Labor Day are another possibility. Winter hotels that close for the summer have in them equipment that might be borrowed for summer food preserving.

Pressure cookers may have to be borrowed from individual owners, or from home economics schools, instead of buying new ones. Second-hand cooking utensils can also be bought through hotel supply houses or even your local second-hand dealers. If can shortages appear, a campaign to collect the glass jars that frequently gather dust in people's basements might be put on, as some PTA's did last summer for school lunch canning projects.

THE AMOUNT OF EQUIPMENT YOU CAN LAY hands on and the size of the kitchen you locate has a good deal to do with the size of your center and its costs. Other items of expense you mustn't forget to figure on while you're adding up totals may include a salary for your manager, unless you can arrange for WPA help; some transportation, though most food supplies may have to be delivered by the donors; and overhead, like fuel, light, books for record-keeping and upkeep.

Your advisory board will have to decide, too, how the center is to operate. It may simply serve families who want to bring in their own produce and preserve it themselves. More common is the kind of center where volunteers can for the community or schools, or partly for themselves and partly for community purposes. Costs of equipment then may be met by the sponsor, with the people using it furnishing the food, labor, and cans they need. Or volunteers may can for families who furnish food, charging a toll of 20 to 40 percent of the canned food as payment. This share then goes to school lunches or local institutions. Or the sponsoring group may furnish equipment, and cans, while volunteers contribute labor and food for community nutrition needs alone. Which type of arrangement will work best in your community is up to you to determine.

IN out-of-school hours or during summer vacations a high school cafeteria might unlock its doors and equipment to community food preservers.

COMMUNITIES WHICH ALREADY HAVE SUCH centers going, have found there are 3 essentials to successful operation, once they've been started. The manager or supervisor must be an able leader who can keep morale high, correct food preservation methods must be used, and accurate records must be kept.

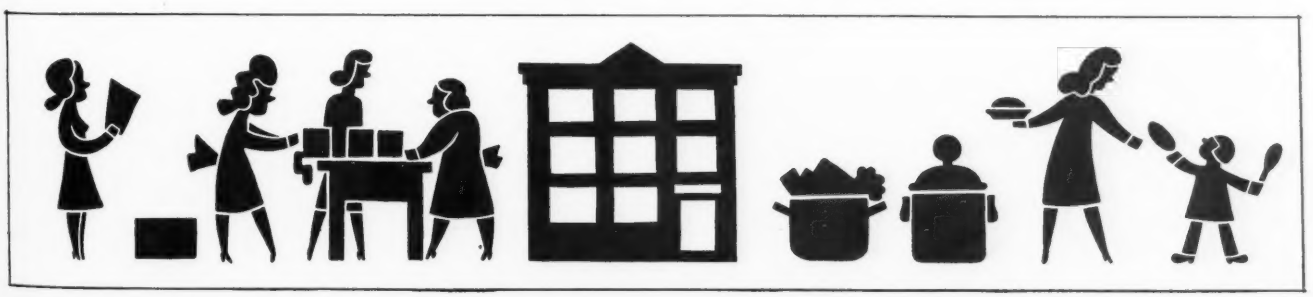
Most important is the manager, for on him depends the rest. Choose him or her with care. He should have technical knowledge of food preservation processes, ability to direct and work with others, business experience. You might find such a paragon among former home economics teachers, home demonstration agents, retired commercial canners, or canners trained in the WPA canning projects.

It must be his responsibility to organize the work of the center so that it runs smoothly and efficiently; to see that high standards of competence are maintained throughout the canning processes. He must plan the training of the volunteers, see that full and careful records are kept, that health and sanitary requirements are met.

THESE ARE ONLY A FEW OF THE PROBLEMS that every community which wants a food preservation center must solve. They'll vary with each local situation. But the results, as many communities have found, more than justify, in the better health of the whole community, the efforts that go into such an undertaking. It's a democratic, neighborly way of doing part of the job of making America strong.

IF YOU WANT TO START, FIRST GET A COPY of the Bureau of Home Economics bulletin. After you have read this, talk about it. Just talking around will get someone else interested. That's the way to muster support and defeat indifference. So much for a starter. Now you carry on.

A leader + workers + a place + food + equipment = a food preservation center



Vitamins make a difference

A doctor tells one doubting consumer how great a difference vitamins can make in bodies and spirits

BEFORE Tonksville's Women's Club settled on a Better Diet campaign as their contribution to National Defense, Ruth Brown hadn't wasted much thought on vitamins. So, when she plunked herself down beside her family doctor's desk one bright fall morning her mind was as clean of knowledge as her notebook was free from notes.

"Look, Dr. Tom," she said, "I'm a Vitamin-know-nothing. Of course, I've heard about vitamin pills that pep you up overnight. I read the papers too, and they're packed full of all sorts of fantastic new discoveries about what vitamins will and won't do. But honest, Dr. Tom, isn't all this vitamin ballyhoo going too far? Do people honestly get sick if they don't get vitamins?"

Dr. Tom smiled.

Ruth, he remembered, was rather given to thinking everything was either black or white. Now it was vitamins that were all black, as it were.

He leaned back in his swivel chair. It was going to take time to set Ruth straight.

"I hardly know where to start, Ruth," he said, "but I must say I agree with you that there is a lot of bunk about vitamins being passed around."

"Isn't it all bunk?"

"Far from it. The discoveries about vitamins are some of the great things that have happened to us humans in the last 20 years."

"How did we get along without vitamins before, then?"

"We didn't. Every kind of food humans have ever eaten, except a few highly processed ones, has had some vitamins in it."

"Even the cocoanuts that used to fall on our heads?"

"Even the cocoanuts. So when you asked me, a minute ago, whether people honestly get sick if they don't get vitamins—well, put that way it's like asking whether people honestly get sick if they don't *eat*. And you know the answer to that yourself."

"THEN WHAT'S ALL THE FUSS ABOUT VITAmins and these marvelous discoveries?"

"Just that we know a great deal now—not all we need to know, though—about what vitamins are; why the body needs them and how much of each it needs; where we can find different vitamins in different foods, and how much each provides. All this makes it so much easier to eat sensibly. I

RATS have their uses as well as being nuisances. More often than not, knowledge gained from experiments on rats holds true for humans, too. The stunted rat on the right has thiamine deficiency while the thriving animal on the left has been feasting on thiamine-rich rice polishings.

mean, eat to be healthy instead of just eating to feel full."

"Then what about all this 'bunk?' You admitted yourself there was a lot of it in vitamins."

"No, I didn't say that, exactly. Vitamins themselves are not the bunk; it's what a lot of people who don't know say about them. Now, if everybody with money to spend were as doubting as you, Ruth. . . ."

RUTH BRUSHED ASIDE THIS DOUBTFUL compliment.

"There wouldn't be so many people fooled about vitamins, you mean?"

"There wouldn't be so many people fooled into thinking vitamins can cure everything under the sun."

"Like making your nose straight, or making your hair blond."

Dr. Tom allowed as how he had never heard such extreme claims as those, and Ruth probably hadn't, either.

"Just the same, it gives you pause when you know that just a few years ago—1938, in fact—our people were buying $100,000,000 worth of vitamin preparations. That makes about $1 a head. Why, half the things they bought probably weren't prescribed by a doctor."

"Yes, but everybody can't afford to come around and have a doctor tell them what they need."

"That's true, too, and tragically true, Ruth. But anyway, it's the wrong way to look at vitamins. For most of us, unless we're really sick or way below par, FOOD'S the best place to go for vitamins."

"NOW YOU'RE COMING AROUND TO WHAT I really wanted to know."

"What's that, Ruth?"

"You said just then, unless you're really sick or below par, get your vitamins in food."

"Always."

"Suppose you are sick?"

"Then a doctor should prescribe for you. And he may prescribe better balanced meals for you. Or he may prescribe vitamin pills."

"But did you ever know of a doctor helping a sick person to get well mainly with vitamins?"

"Lots and lots, Ruth. But the biggest part of vitamin deficiency in this country isn't severe enough to come to our attention. It shows up in people who feel let down, tired, or irritable a great deal of the time. They lay their trouble to a lot of things—working too hard, not getting enough sleep, worry—

BATS see best at night. Humans don't. To test the speed with which the eye adjusts from bright light to darkness an adaptometer like this is used by Government experts. Eyes which take too long to adjust are said to be night blind. Some night blindness is due to too little Vitamin A.

and 9 out of 10 times they let it ride, and never come to see us doctors."

"Then they're really the important people to reach with this vitamin information."

"You're right. Too often it's only the people who are very seriously short on vitamins who get to us."

"Does the disease of not having enough vitamins have a name, Dr. Tom?"

"We lump all that kind of sickness together and call it *avitaminosis*. That's just fancy for saying you're sick because you didn't get enough vitamins."

"Give me an example, won't you?"

"Let me take a look at my cards here, Ruth. . . . Yes . . . here's one right off the top that'll show you what I mean.

"Here's a person suffering from not getting enough thiamine chloride."

"Maybe if I knew what that meant . . ." Ruth said lamely.

"Well, thiamine chloride, Ruth, is the most accurate name for a vitamin often called B_1 which makes its way into your blood stream via whole-grain cereals, meats, various kinds of green and dried beans and peas. When you begin to run low in thiamine chloride all sorts of things go wrong. You lose your appetite, you get aches and pains and neuritis, and when it gets bad enough you get heart disturbances and swelling of the feet and difficulty in walking.

"NOW, THE PATIENT WAS A WOMAN WHO wasn't getting enough B_1, or thiamine chloride. Her husband had been out of work for some time. I talked with her and found out that she had been sacrificing her own food so as to make sure her children got all they needed. She had to, because she had so little money. The main reason for her visit was that she had become terribly depressed. Ordinarily, she was fairly level-headed so I thought her emotional disturbance might have a clear physical cause. I looked around for some other symptoms and found that her feet and the muscles of her legs were extremely tender. That pointed to a possible B_1, thiamine, deficiency which was plausible because of diet conditions. We tried giving her large doses of thiamine with very good results. In fact, she's her normal self again, emotionally speaking, and the tenderness has disappeared, too."

"Well, that certainly shows the effect of one vitamin dramatically enough. What about the milder cases where there isn't enough thiamine? Have you any of those?"

"I was just coming to that, Ruth. You know this is a locality where incomes shoot up and down almost overnight. When steel mills close down, purses flatten out pretty quickly, and to show just how short a time it takes for the change in income to be re-

flected in the thiamine content of Tonksville's diet, I'll give you this little statistic. I can tell without looking at the headlines how employment in the mills is going by the increase or decrease in my patients with slight thiamine-deficiency symptoms."

"I'm sure no one realizes that a vitamin lack can start showing up that quickly."

"Well, in this case it's really a matter of income. People like you stand a fair chance of getting a good supply of thiamine all the time. If you were to have your rations cut for a week, probably you wouldn't know the difference. But low-income families in this country are usually pretty close to the minimum safety level on their thiamine quotas. When their diets take a cut they're apt to feel it quickly, and they're the steel workers and their families who come in with unaccountable aches and pains and swellings, that all point right back to a B_1, or thiamine, lack."

"But what can you do about them, Dr. Tom, if their incomes are cut so they can't get good meals, they certainly can't buy pills, can they?"

"No, they can't, Ruth, and there are plenty of them who can't by any stretch get the food they need, but there are a lot of them who can do better by learning what good meals are and how to plan them on what they have to spend.

"NOW LET ME TELL YOU ABOUT SOME other vitamin cases I run into. I'll be here all day at this rate! That might be all right for my vitamin-deficiency cases, but not so good for the rest of my patients.

"Here's a funny one, in a way. Besides being a patient, he's one of my old friends. About a month ago he got picked up at night for drunken driving—so-called. Well, if you knew the man as well as I know him, you'd know there's no better tee-totaler in Tonksville.

"This man, we'll call him Bill, is a big husky chap. He weighs 200 if he weighs an ounce. That's how it all started, if you can believe it.

"He started dieting—on his own, mind you. His idea of a diet just happened to cut out all the vegetables and dairy products that give us our Vitamin A supply. He lost weight all right and he felt all right, too, until he started having trouble driving at night.

"He told me about the cop incident on the golf course one day and the first thing I thought about was his eyes. I said, 'Bill, come on down to the office and let me take a look at your eyes.' And sure enough, I found night blindness and eye changes due to Vitamin A deficiency. Bill had all the earmarks of *hyperkeratosis,* which is a long way of saying he had a skin trouble that big doses of Vitamin A and a balanced diet could remedy. That's what I prescribed. Now his eyes are all right and the skin's cleared up, too."

"Dr. Tom, what would have happened if you hadn't happened to look at Bill's eyes?"

"Well, in Bill's case, probably nothing much, because soon he would have noticed there was something very wrong, himself, but believe it or not, there's plenty of eye trouble in the country today that starts off that way and never gets treated.

"NEW YORK PUBLIC HIGH SCHOOL STUdents are a fair sample of the population, and in one large New York high school in a low-income neighborhood 86 percent of the students showed Vitamin A deficiency! The interesting thing about that is that if these children got the cod liver oil that you probably think most children get, they wouldn't have this trouble."

"Does cod liver oil supply Vitamin A?"

"Vitamin A and D, both. Vitamin D, of course, is the rickets preventive. The fact that over half of the children in the temperate zone show some traces of rickets gives you an idea of how much more cod liver oil is needed. They might not be obviously deformed—but their teeth might be malformed or soft, their legs bowed, their knee and ankle joints enlarged. Rickets comes from lack of Vitamin D."

"What other kinds of cases do you see, Dr. Tom?"

"WELL, HERE IS AN INTERESTING GROUP. The first person in this family who came to me was the mother—we'll call her Mrs. Jones. First of all, she had digestive trouble—bad diarrhea—and besides that, she was losing weight and complained of fatigue and nervousness. I really didn't have to ask about her diet to figure out that she had mild symptoms of pellagra and needed nicotinic acid in a hurry. Incidentally, the family existed mainly on white flour, corn meal, fat meat, hominy grits, and syrup. They practically never tasted milk, leafy or green vegetables and lean meats that keep pellagra away."

"Did you do anything about that mother's diet, Dr. Tom, or was it too late?"

"We did what we could about it by replacing some of the starches with low-cost greens—collards, mustard greens, spinach—and adding some evaporated milk, but, of course, she had to have doses of pure nicotinic acid besides."

"What about the rest of the family? Why didn't they have the same thing?"

"They did, in varying degrees. There were 3 children from 6 to 12. They were all underweight and small for their ages. They were behind in school, and one of them had sores around his nose and mouth, and eyes that were irritated."

"You mean all those things come just from lack of that one vitamin?"

"As far as we know, they can. So far I can't tell a lot about height, but the children have gained in weight and they're better off in school. The one child with sore eyes and dermatitis (that's skin trouble) strangely enough responded to riboflavin (another one of the B complex vitamins) and apparently riboflavin-deficiency symptoms and pellagra symptoms often occur together."

"But what about the nervousness in the mother? You can't tell me that came from not getting enough nicotinic acid."

"It does sound incredible, but plenty of my colleagues bear me out. They've had much worse cases than that—cases where men and women were reduced to almost complete stupor—couldn't keep their eyes open, couldn't talk, and responded to treatment with nicotinic acid so that in 5 hours they were alert and happy. And none of them had any of the usual symptoms of pellagra.

"AND NOW, RUTH, I'VE GOT TO GET started on my calls."

"But, Dr. Tom, I see Vitamin C on that chart as plain as day and you haven't said a word about that."

"What do you want, Ruth, a medical course in an hour? There's lots more to this story. Catch me again some morning and I'll give you a second instalment to pass on to Tonksville's families."

As he rounded out his last remarks, Dr. Tom had somehow managed to gather up a lot of instruments and bottles and bandages from various corners of the office and stuff them into his little bag, and before Ruth had even had time to thank him properly, he was out of the door and off.

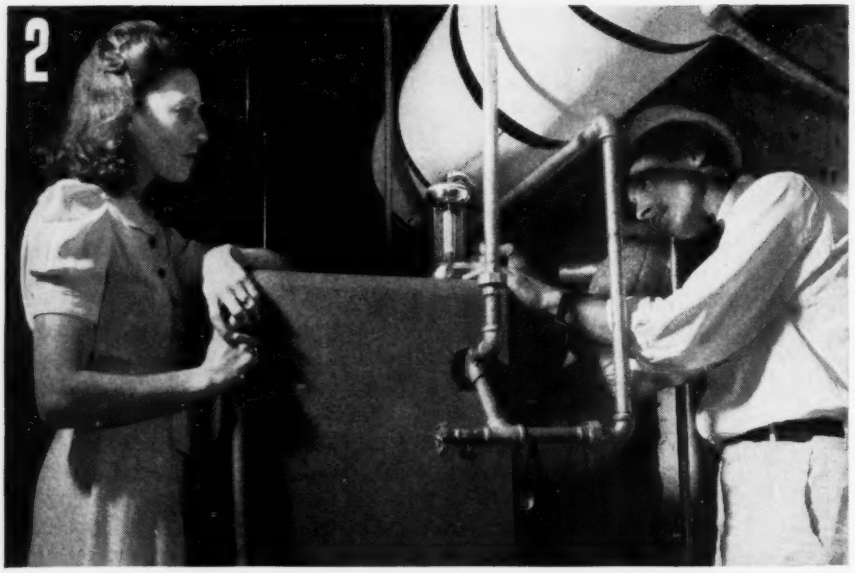
When it was all over and Ruth had had a chance to catch her breath, it didn't take her half a shake to realize that a Better Diet Campaign was a very practical contribution to National Defense. She was rather proud of Tonksville's women's club for getting to work on it, and thought she'd lend a hand.

More heat, less fuel

Up the chimney instead or into radiators and rooms goes too large a part of the Nation's heat each winter. Because oil for heating the outdoors can't get priority over oil for Defense, Agriculture's Bureau of Agricultural Chemistry and Engineering has been putting its engineering brains to work to find out ways to get the most household heat for the least fuel. More tips on fuel oil conservation will come in a later issue, and the *Consumers' Guide* will come to the aid of coal furnace owners too.

1 If you depend on an oil burner to keep your house warm this winter, chances are you can cut down your fuel bill (and go easier on oil needed for Defense, in the bargain) by having an experienced service man check the efficiency of your burner and furnace. By finding the CO_2 content and the temperature of the waste gases going up the chimney, he can tell to a "T" how well the burner is working. CO_2 is what a furnace (and you) breathes out. Like your own lungs, a furnace takes in oxygen and lets out CO_2, creating energy out of the exchange. The more CO_2 in the furnace gas that goes up the flue, the more sure you are that the furnace is doing its work of making things hot. The service man starts his checkup by punching a neat hole in the furnace flue which, incidentally, he seals up afterwards. Into this hole goes a special thermometer to take the temperature of escaping gases. "The hotter the flue gas, the higher the fuel waste," is generally true, because heat going up the chimney is not doing anyone any good. Most furnaces designed for burning oil can absorb enough heat so that temperature of the waste gases passing through the flue won't go above 400° F. The flue being tested here is hotter than anyone would like to be—900° F.

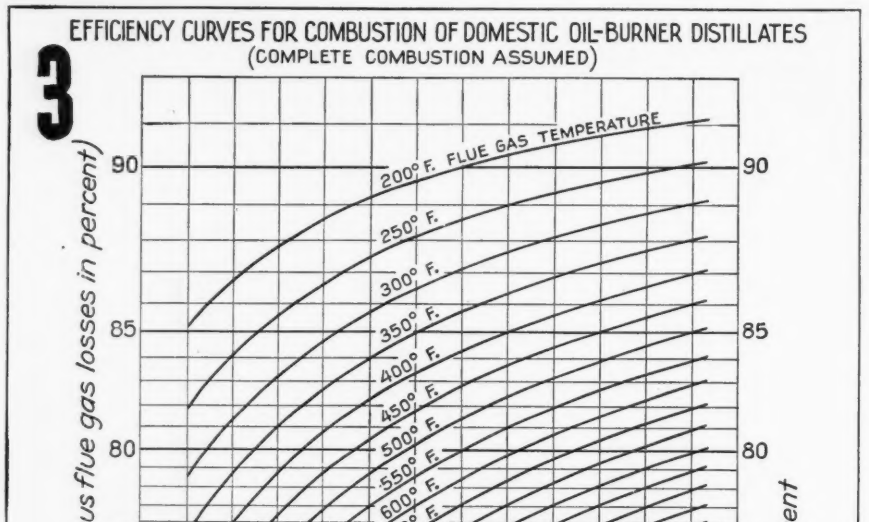
2 Next, a tube from a gas analyzer goes into the hole in the flue for a sample of gas to test for CO_2 content. CO_2 is carbon dioxide, and carbon dioxide is made when fuel (in this case, oil) and air combine, or burn. The better the combination, the higher the percentage of CO_2 in the gas going up the chimney. So, the higher the percentage of CO_2, the more efficient the burner. The CO_2 percentages that oil burner experts strive for run from 10 to 12. They have found that higher CO_2 content isn't practical. In this house CO_2 in the flue runs 6 percent.



oil for burning, until the flame is clean. Now the flue gas analyzer indicates a CO_2 percent of 10. He knows from experience that a higher CO_2 percentage with this type of burner just isn't possible. Reading flue temperature again he finds what he expected, a drop from 900° F. to 800° F. Turning back to his chart he translates the results of his work into terms of increased efficiency, and finds he's upped it to 73 percent.

6 Door openings are often leak spots. Clean-out doors can usually be permanently sealed. But firing doors occasionally have to be opened for minor burner adjustments. If possible, they should be made leak-proof without sealing, by tightening

3 Flue temperature and CO_2 percentage of flue gases are all a service man has to know in order to calculate an oil furnace's burning efficiency. To make calculating simpler he uses a new efficiency chart made up by the BACE which is available to oil companies. On this chart, the point where the CO_2 percentage crosses the temperature curve equals the efficiency. The point where 6 percent CO_2 crosses the 900° F. temperature curve represents an efficiency of 56 percent, he finds. Any service man can tell you that's low—about 14 percent lower than the minimum efficiency of 70 percent that oil burner owners can expect.



4 Since excess air upsets the fuel-air combination which makes a furnace burn best, shutting out air leaks in the furnace is the first way to step up efficiency. To locate leaks, the jacket and layers of insulation which pad the heater's surface have to be removed. Then, while the burner is in operation, the service man looks for all possible cracks. He does this with a lighted candle, because, when leaks are present, air drafts will suck the candle flame in towards the furnace. Furnace cement is used to seal these openings thoroughly.

5 Trying for still more efficient fuel consumption he turns to the shutter on the burner, itself. Adjusting the shutter he cuts down the flow of air which combines with

hinges and fasteners. When all leaks are plugged, the service man reads his flue analyzer again; finds CO_2 percentage has jumped 2 points to 8 percent.

FINALLY, Mr. and Mrs. Householder can see the sealed sections and doors, but percentages of efficiency mean nothing to them. They want to know how they can cut oil consumption and oil bills. To heat their 7-room house last year, 2,000 gallons of fuel oil ran into their furnace. Then, their burner efficiency was 56 percent. Now, heating is 73 percent efficient. Taking the formula the service man gave them: $\frac{\text{old efficiency}}{\text{new efficiency}} \times$ old fuel consumption = new fuel consumption, they have some arithmetic that looks like this:

$\frac{56}{73} \times 2{,}000 = 1{,}540$ gallons, approximately.

Then, figuring their oil cost at 7 cents a gallon, they find their service man's checkup will save them $32 this year. Not all householders can expect such large savings but checkups observed by the Department of Agriculture, Bureau of Agricultural Chemistry and Engineering show possible average savings of around 12 percent.

How did you make out?

Here are the answers to the food puzzlers published in the last issue of Consumers' Guide. Check your own answers against them to see how well you know your food facts.

1. According to standards set under the Federal Food, Drug and Cosmetic Act, flour can be labeled "enriched" only when it contains specified amounts of Vitamin B_1, riboflavin, nicotinic acid, and iron. It may also contain certain amounts of Vitamin D, calcium, and wheat germ or partly defatted wheat germ, but this requirement is purely voluntary.

2. Pellagra, ariboflavinosis and scurvy are diseases which are caused specifically by deficiencies of certain kinds of food nutrients. Pellagra is due largely to lack of nicotinic acid in the diet. Ariboflavinosis literally means too little riboflavin. Serious lack of Vitamin C leads to scurvy.

3. (*a*) By wrong cooking methods you *can* destroy certain vitamin values in fruits and vegetables.

(*b*) The weight of a dozen eggs may vary as much as 10 ounces, or even 15 ounces. All Federal retail grades for eggs specify weight and size.

(*c*) One way to keep from crying when you peel onions is to hold them under water while you're peeling them.

(*d*) Butterfat is never present in chocolate or cocoa. These 2 foods usually differ in the amount of cacao fat; cocoa is chocolate from which part of the cacao fat has been removed. Last October, the Food and Drug Administration proposed definitions and standards of identity for these foods. A public hearing has been held, but these standards have not yet been adopted.

(*e*) Vitamin C cannot be stored up in large quantities in the body. That's why it is important to get the Vitamin C you need each day.

4. Cottage cheese is made from skim milk.

5. Oranges are most plentiful and lowest in price in the winter.

6. Of the 3 months suggested, May, August, and October, you'll find fresh tomatoes cheaper in August.

7. Oranges, tomatoes, and cabbage are starred because of their Vitamin C.

8. Whole wheat, lima beans, liver, and molasses are foods that are rich in iron.

9. Plate and brisket are relatively lower in cost than the other cuts of beef named. Pound for pound of lean meat they are as nutritious as the more expensive cuts of beef.

10. Five ounces of American Cheddar cheese will give about the same food value as one quart of whole milk. So Mrs. Smith's new order would give her more than her usual amount of nutrients.

11. Each day it's a good rule to drink 6 or more glasses of water.

12. Nutritionally speaking, the protein-rich main dish of your meal could be fish, eggs, soybeans, as well as meat.

13. Of the foods Gladys ate, the shelled peanuts and the bar of chocolate candy contained the most fat, but of course fat-rich foods in themselves may not have been what made Gladys fat. It may have been that her entire diet added up to a caloric value way above what her body needed.

14. Tommy shouldn't have poured the old cream into the bottle of new cream because bacteria that had probably multiplied in the old cream were added to the fresh. By combining them, he helped to speed up the souring of the new cream.

15. You don't have to drink fluid whole milk to get your daily milk quota. The nutritional equivalent of a quart of fluid whole milk may also be obtained from:

1 quart of skim milk plus 1½ ounces of butter
4½ ounces of dry whole milk
17 ounces of evaporated milk

16. Mrs. So-and-So's boners were: (1) Preparing her vegetables and putting them to soak for hours so the vitamins wasted away in the water. (2) Cooking her vegetables for an hour. Most vegetables should be cooked in as short a time as possible to preserve the vitamins. (3) Pouring off the water in which the vegetables were cooked, instead of saving it for its valuable vitamins and minerals. (4) Buying potatoes by the quarter's worth instead of by the pound. This kind of buying keeps Mrs. So-and-So from taking advantage of quantity savings, also makes it impossible to check up on whether she's getting proper weight for her money. (5) The liquid in canned salmon contains some Vitamins A and D; it, too, should never be poured away.

17. The Federal Security Administrator establishes standards of identity, of fill, and of minimum quality for foods under the provisions of the Federal Food, Drug, and Cosmetics Act of 1938, but the Federal Trade Commission has laid down fair trade practice rules which govern tuna fish labels.

18. Meat entering interstate commerce must be inspected for wholesomeness by the Federal Meat Inspection Service of the Bureau of Animal Industry; grading services are performed on request by the Agricultural Marketing Service for a nominal fee. If, after meat enters interstate commerce, it becomes unfit for human consumption, then the Food and Drug Administration seizes and destroys it.

19. The lowest-income third of American families spent an average of about 8 cents a meal for food, according to the 1935–36 Consumer Purchases Study.

20. You usually have to drink 2 cups of tomato juice to get as much Vitamin C as you get from one cup of orange juice. But of course you want to figure costs per cup, too.

21. Grade C canned apricots, like all Grade C foods, are often a wise buy when the food is to be cooked or combined with other foods. Uniformity of size and shape are not so important then.

22. U. S. Grade A on canned fruits and vegetables means that they were packed and graded under the continuous supervision of Department of Agriculture inspectors. Plain Grade A or B or C means that a food conforms to a Federal quality standard, but the food may not necessarily have been inspected by a Federal inspector.

23. Raw or undercooked pork is dangerous to eat because it may be contaminated with parasites which cause a disease called trichinosis. Always make sure pork is cooked clear through to the bone.

24. Farmers who sell their milk for $2.50 a hundredweight get 5.38 cents per quart; when you know that a quart of milk weighs 2.15 pounds, you can figure this out yourself.

25. The lean part of pork has more Vitamin B_1 than the lean part of the other meats named.

26. The Federal Food, Drug, and Cosmetics Act of 1938 and the Wheeler-Lea Act of 1938, extending the powers of the Federal Trade Commission are 2 important laws Congress has passed for the protection of the consumer.

27. Any food which agrees with you by itself won't hurt you when it's mixed with other foods. So you're perfectly safe eating fish, meat, and milk together if you can eat each one alone.

28. Table or coffee cream in interstate commerce must contain at least 18 percent butterfat to conform to the standard set under 1938's Food, Drug, and Cosmetic Act. Butterfat content of intrastate cream depends on your State or local laws.

29. (*a*) Cauliflower is not a starchy vegetable; it is a very good source of Vitamin C.

(*b*) Grade C canned vegetables are as rich in food value as Grade A and Grade B.

(*c*) The water in which eggs are cooked should never be permitted to boil. Keep the water simmering to keep the egg protein tender.

(*d*) Vegetables bottled in glass may lose some of their vitamins if they are stored where the sun can reach them, because light destroys some vitamins.

(*e*) Egg shells are porous, and if you store eggs next to strongly flavored foods, the eggs will absorb the odor and flavor. Keep them covered or store them where flavors and odors won't reach them.

30. Codfish, flounder, haddock, are among the fish that are relatively low in fat.

31. You save about .36 cent an ounce when you buy the No. 2 can of canned peas. Since there are 20 ounces (1 pound 4 ounces) in a No. 2 can and 29 ounces (1 pound 13 ounces) in a No. 2½ can, you can save money by reading labels carefully and comparing costs per ounce.

32. The Bureau of Animal Industry defines beef as meat derived from cattle nearly 1 year of age or older. Veal is meat from cattle less than 1 year old. Lamb is meat from sheep less than 1 year of age, and mutton is from sheep 1 year old or older.

33. To get a cup of shelled nut meats you'd have to buy about half a pound of peanuts, a little more than a pound of English walnuts, and 2 pounds of black walnuts.

34. Boiling, baking, or steaming with the skin on, gives you the maximum food value from an old potato. Usually it is also less wasteful to peel potatoes after they're cooked than before.

35. To get the same nutritive value as you get from a quart of fresh skim milk, you'd need 3½ ounces of dry skim milk with 3¾ cups of water.

36. The onion family includes such flavorsome vegetables as leeks, shallots, and chives.

PLEASE NOTE

There has been some confusion about one of the listings in the Consumers' Bookshelf which appeared in the January 15, 1941 issue of the CONSUMER'S GUIDE, page 12. We listed a publication YOU CAN MAKE IT as being available from the Superintendent of Documents for 10 cents. It appears that this publication is one of a series which bears a general title. In order to clear up any misunderstanding we are listing below all publications in this series:

(1) YOU CAN MAKE IT. 1929, pp. 58. 10 cents.

(2) YOU CAN MAKE IT FOR CAMP AND COTTAGE. 1930, pp. 55. 10 cents.

(3) YOU CAN MAKE IT FOR PROFIT. 1931, pp. 52. 10 cents.

The series outlines practical uses for second-hand boxes and odd pieces of lumber. All orders should be addressed to the Superintendent of Documents, Washington, D. C.

OUR THANKS for photographs go to: Cover, Agricultural Adjustment Administration; pp. 2, 3, and 14, Farm Security Administration; pp. 4, 11, 12, and 13, Department of Agriculture Information; pp. 8 and 9, Bureau of Home Economics.

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In this issue

DECEMBER 15, 1941 VOLUME VIII, NUMBER 4

Consider the cow 2

Stop food waste 5

PUBLIC LIBRARY
DEC 0 1941
DETROIT

Vitamins make a difference 8

More heat, less fuel 11

How did you make out? 14

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VIRTUAL REALITY

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